

# Introduction to Ultra HD Blu-ray Disks

- and the UHD Eco -System





**WHY**

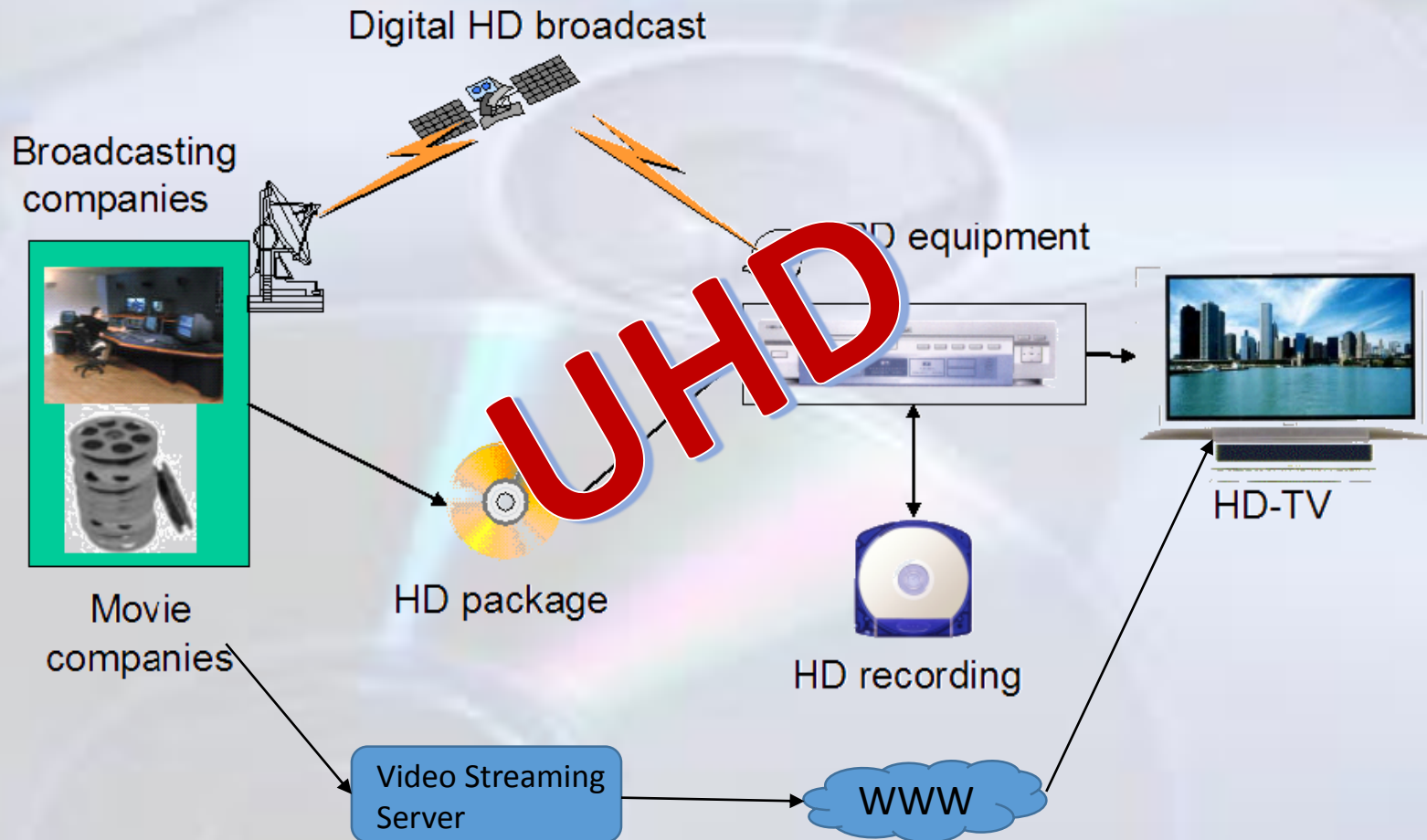
**HOW**

**WHEN**

# WHY

driving force to promote HD

- HD recording and HD package reproduction together accelerate the HD application



# Digital Video Broadcasting *Terrestrial*

## Oceania [\[ edit \]](#)

-  [Australia](#) (uses DVB-T/MPEG-2 for both SD and HD transmissions.)
-  [New Zealand](#) (uses MPEG-4/H.264 video; see [Freeview New Zealand](#))

## The big companies behind 4K are teaming up with Hollywood to form the UHD Alliance

The UHD Alliance, which brings together Hollywood studios, consumer electronics brands, content distributors, post-production and technology companies, aims to overcome the issue by "helping people benefit from a seamless, integrated and high-quality Ultra HD ecosystem".



According to Netflix, High Dynamic Range is more important for digital video quality than 4K resolution

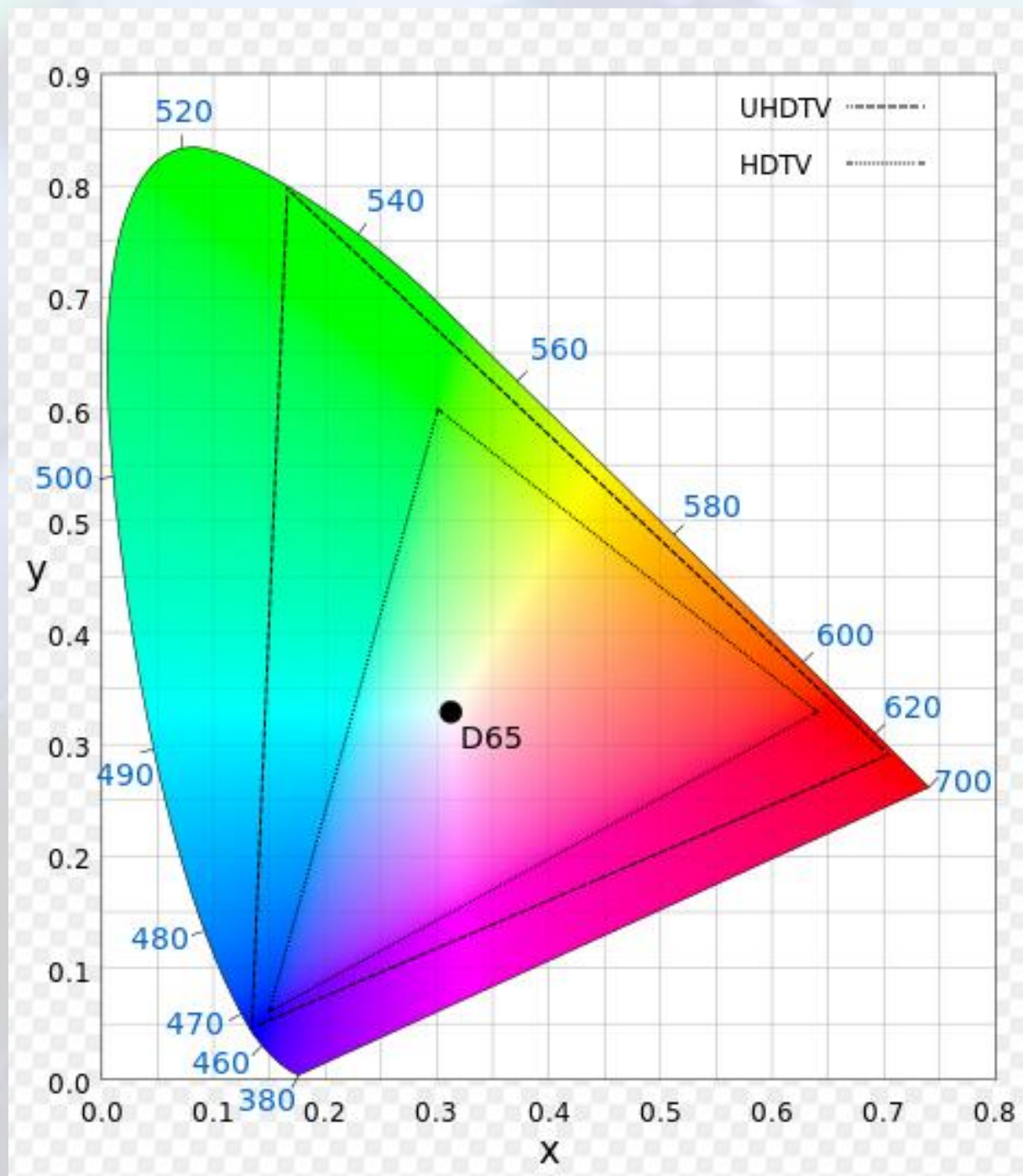
This means that getting the brightness, contrast, detail and color realism to improve is more important than upping resolution even further than 4K levels.

# ***Ultra HD Blu-ray Format***

BDA (*Blue-ray Disk Association*) specified the Ultra HD Blue-ray format for 50 Gb , 66 GB and 100 GB Rom disc – May 2015.

- *Video up to 3840 x 2160 (4k/UHD)*
- *High Dynamic Range (HDR)*
- *Larger color gamut*
- *60 Frames /sec*

*Object-based sound formats -- DTS:X and Dolby Atmos  
can be used but not mandatory*



# High Dynamic Range

High-dynamic-range imaging (HDRI or HDR) is a technique used to reproduce a greater dynamic range of luminosity.



The [chancel](#) of the Byzantine Christian church in *Lost Coast*, which Viktor Antonov of the [Valve Corporation](#) calls a "great showcase for HDR".

The aim is to present the human eye with a similar range of luminance as that which, through the visual system, is familiar in everyday life



# ***High Dynamic Range***

Presently HDR processing is supported on many computer devices eg X-Box, Playstation, and computer video cards particularly with GPU's and used for computer games





# Object Based Sound System

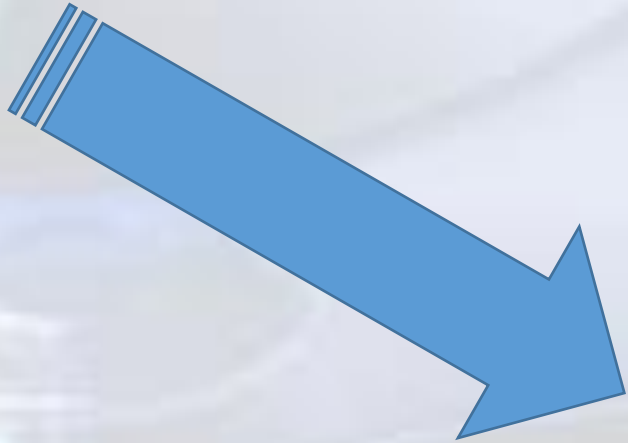


# LED Versus OLED

Brightness (or luminance) is measured in 'nits'.

TVs today have a peak brightness of around 100 nits.

The peak brightness of an HDR television is around 1,000 nits.



### *More nits require more **bandwidth***

Delivering an HDR picture requires about 20 per cent more bits than the equivalent resolution.

- 4K is normally delivered in about 15Mbps.
- 4K HDR requires 18Mbps;
- 2K is delivered in 5-6Mbps,
- 2K HDR requires 8Mbps.

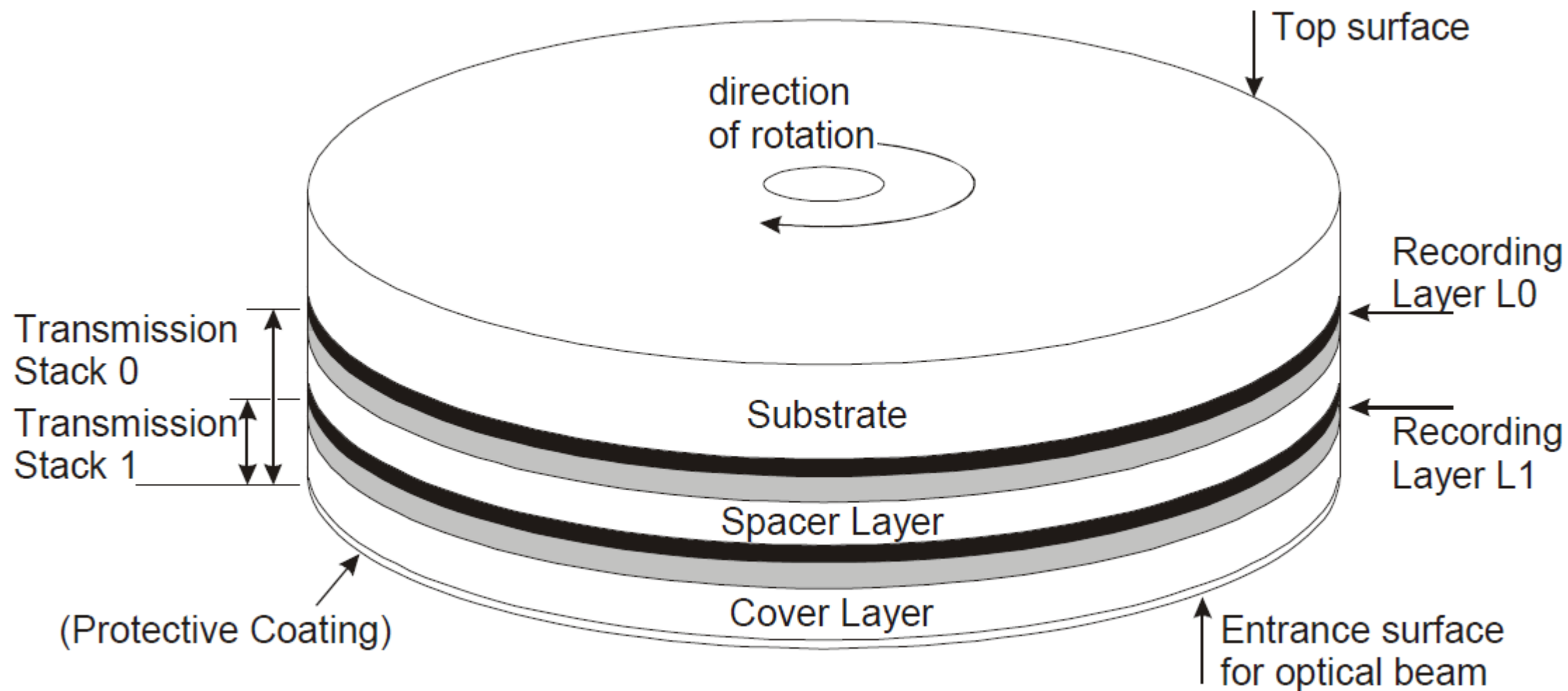

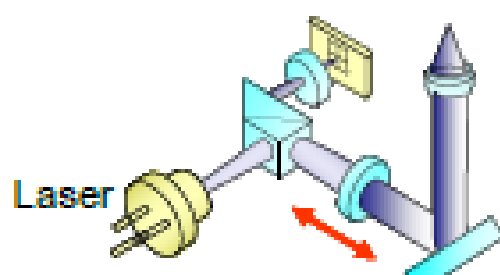
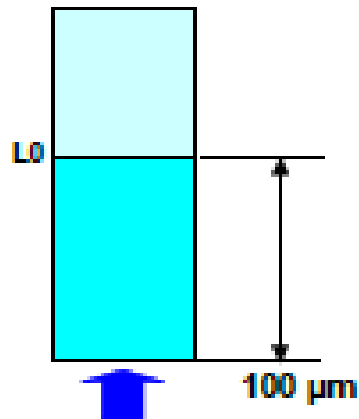
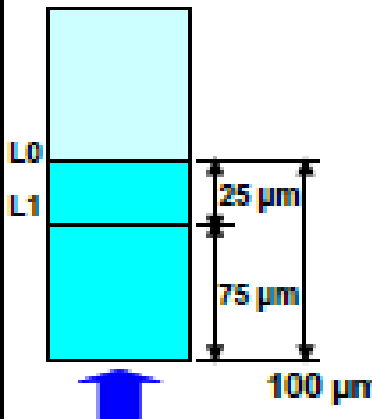
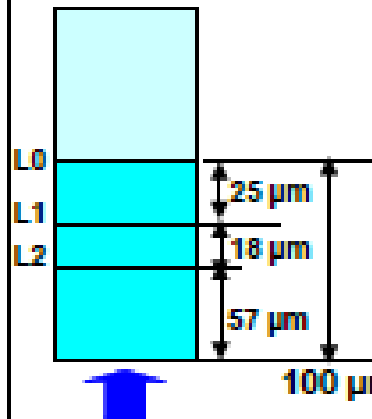
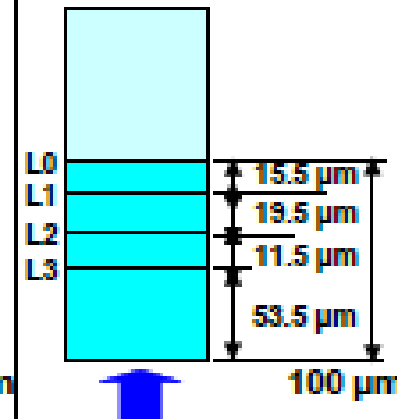


Fig. 1.3.2.3 Structure of Dual-Layer disc

**Table 1.4.3.1 Brief ROM physical specifications of Ultra HD Blu-ray™**

Disc type	ROM		
Layer	DL		TL
Capacity	50 GB	66 GB	100 GB
Capacity/layer	25.0 GB	33.4 GB	
Minimum-Mark length	0.149 $\mu\text{m}$	0.112 $\mu\text{m}$	
Track Pitch	0.32 $\mu\text{m}$		
Modulation	17PP		
ECC	LDC with BIS		
Sector / Block size	2 KB / 64 KB		
Track path	Opposite track path		
Physical reading speed from drive	72 Mbps (Low TR option) 92 Mbps (default)	92 Mbps (Low TR option) 123 Mbps (default) 144 Mbps (High TR option)	

### Brief parameters of pick-up and disc structure

Layer	SL	DL	TL	QL
Pick up				
NA*	0.85			
Wave length*	405 nm			
Disk structure*				

\*Typical value

2015 2016 Buyer's Guide to Dolby  
Atmos and DTS X Receivers





HDMI-V 2.0 High  
Bandwidth Connections

The background of the slide features a close-up, slightly blurred view of a CD or DVD surface, showing its characteristic concentric tracks and reflective properties. Overlaid on this background is a faint, light blue network diagram consisting of several circular nodes connected by thin lines, suggesting a digital or technological theme.

# Samsung & UHD Alliance

# Summary: The UHD Eco-System

## When

2015

- Standards released
- Manufacturers and Hollywood working together
- Initial releases of some products pre Xmas 2015
- Higher initial prices

2016/17

- Consumers products more widely available
- More UHD Content on Blu Ray released.
- Many Australian Home still on slow internet